

## CLAIMS

24. (New) A neuronal device for modulating neuronal activity, said device comprising:
- (a) a housing having a surface biocompatible with at least a portion of a neuronal cell;
  - (b) an aperture in said surface; a reservoir connected to said aperture; and
  - (c) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.
- 25 (New) The device according to claim 24, wherein said flow regulator is an electrical device.
- 26 (New) The device according to claim 24, wherein said surface is micropatterned for directing a neuronal process toward said aperture.
- 27 (New) A neuronal device for modulating neuronal activity, said device comprising:
- (a) a housing having at least one aperture;
  - (b) a surface biocompatible with at least a portion of a neuronal cell and micropatterned for directing growth of a neuronal process to said aperture;
  - (c) a reservoir connected by a channel to each said aperture; and
  - (d) an electrically controlled flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.
28. (New) The device according to claim 27, wherein said micropattern comprises bioactive agents and directs growth of said neuronal process to said aperture.

29. (New) The device according to claim 27, wherein said device is of a size to fit into a subretinal or epiretinal site.
30. (New) The device according to claim 27, wherein said device comprises at least one photodiode.
31. (New) The device according to claim 27, having a well in said surface, said aperture opening into said well.
32. (New) A neuronal device for modulating neuronal activity, said device comprising:
- (a) a housing of a flexible material having a surface biocompatible with at least a portion of a neuronal cell;
  - (b) an aperture in said surface;
  - (c) a reservoir connected to said aperture; and
  - (d) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.
33. (New) The device according to claim 32, wherein said flexible material is a polysiloxane.
34. (New) The device according to claim 32, wherein said device is comprised of two layers:
- (a) a first layer comprising at least one reservoir and at least one channel, each reservoir connected to a channel; and

- (b) a second layer covering said first layer enclosing said reservoir and channel and having an aperture in communication with said reservoir.

35. *(New)* The device according to claim 34, wherein said second layer is micropatterned for directing growth of a neuronal process to said aperture.

36. *(New)* The device according to claim 32, wherein said flow regulator is an electrical device.

37. *(New)* The device according to claim 36, wherein said device comprises photodiodes and said electrical device is actuated by photodiodes.

38. *(New)* A neuronal device for modulating neuronal activity, said device comprising:
- (a) a housing having a surface biocompatible with at least a portion of a neuronal cell;
  - (b) an aperture in said surface; a reservoir connected to said aperture; and
  - (c) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture, wherein said neuronal device comprises at least one of a flexible housing, a flexible membrane pump or a light sensitive polymer flow regulator.